

KENTUCKY STATEWIDE WOOD ENERGY TEAM

Felling a few LOGS for Energy

**Logistics
Opportunities
Growth
Sustainability**

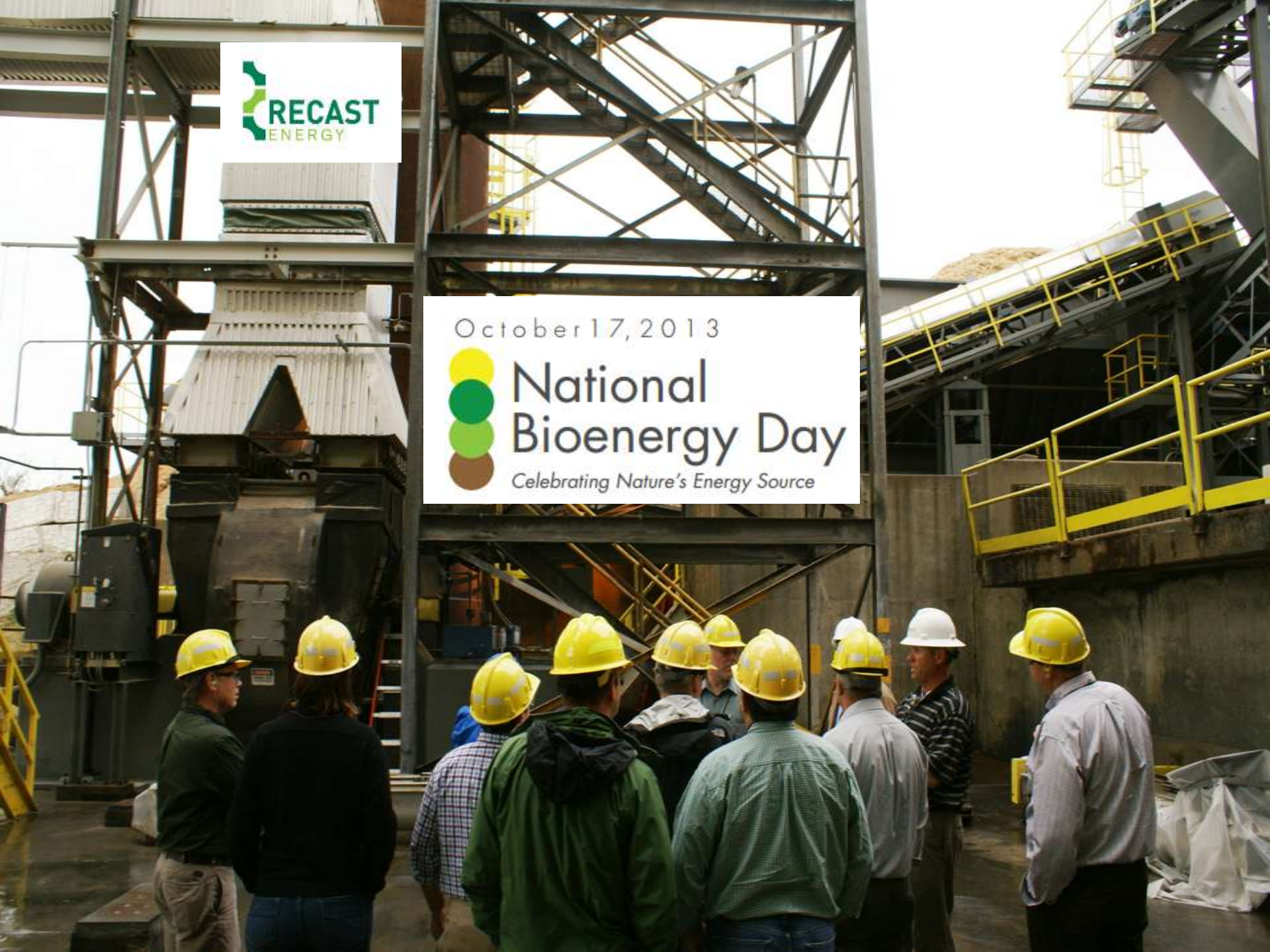


October 17, 2013



National
Bioenergy Day

Celebrating Nature's Energy Source





MCEE

Midwest Clean Energy Enterprise LLC



Kentucky National Highway System

With Major Intermodal Terminals

LOGISTICS



- | | | |
|--|-------------------------------|----------------------------------|
| AU Audubon Parkway | County Seats | Airport |
| BC Bert T. Combs Mountain Parkway | Interstate System | Amtrak Station |
| BG Martha Layne Collins Bluegrass Parkway | Stranet Major Connector | Highway / Rail Transfer Facility |
| EB Edward T. Breathitt Pennyrite Parkway | Intermodal Connector | Intercity Bus Terminal |
| HR Hal Rogers Parkway | Other NHS Route | Pipeline Terminal |
| JC Julian M. Carroll Purchase Parkway | Dept. of Defense Installation | Port Terminal |
| LN Louie B. Nunn Cumberland Parkway | MPO Boundary | |
| WK Wendell H. Ford Western Kentucky Parkway | | |
| WN William H. Natcher Parkway | | |
- Full NHS Route Listing Found At
http://www.planning.kytc.ky.gov/maps/nhs/NHS_list.pdf



Active Rail Lines of Kentucky



Class I Railroads

- Burlington Northern Santa Fe Railway (BNSF) *
- Canadian Pacific Railway (CP) *
- CSX Transportation (CSXT) *
- Illinois Central Railroad (IC) *
- Norfolk Southern (NS) *

Class II Railroads

- Paducah and Louisville Railway (PAL)

Class III Railroads

- Bluegrass Railroad (BLUE)
- Fredonia Valley Railroad (FVRR)
- Hardin Southern Railroad (HSRR)
- Kentucky & Tennessee Railway (KT)
- Kentucky, West Tennessee Railway (KWT)
- Lexington & Ohio Railroad (LXOH)
- Louisville and Indiana Railroad Company (LIRC)
- R.J. Corman Railroad / Bardstown Line (RJCR)
- R.J. Corman Railroad / Memphis Line (RJCM)
- Tenniken Railroad (TKEN)
- Transkentucky Transportation Railroad (TTIS)
- United States Government (USG)
- Western Kentucky Railway (WKRL)

* Dashed Line Indicates Trackage Rights Only

Louisville



1 0 1 2 3 Miles

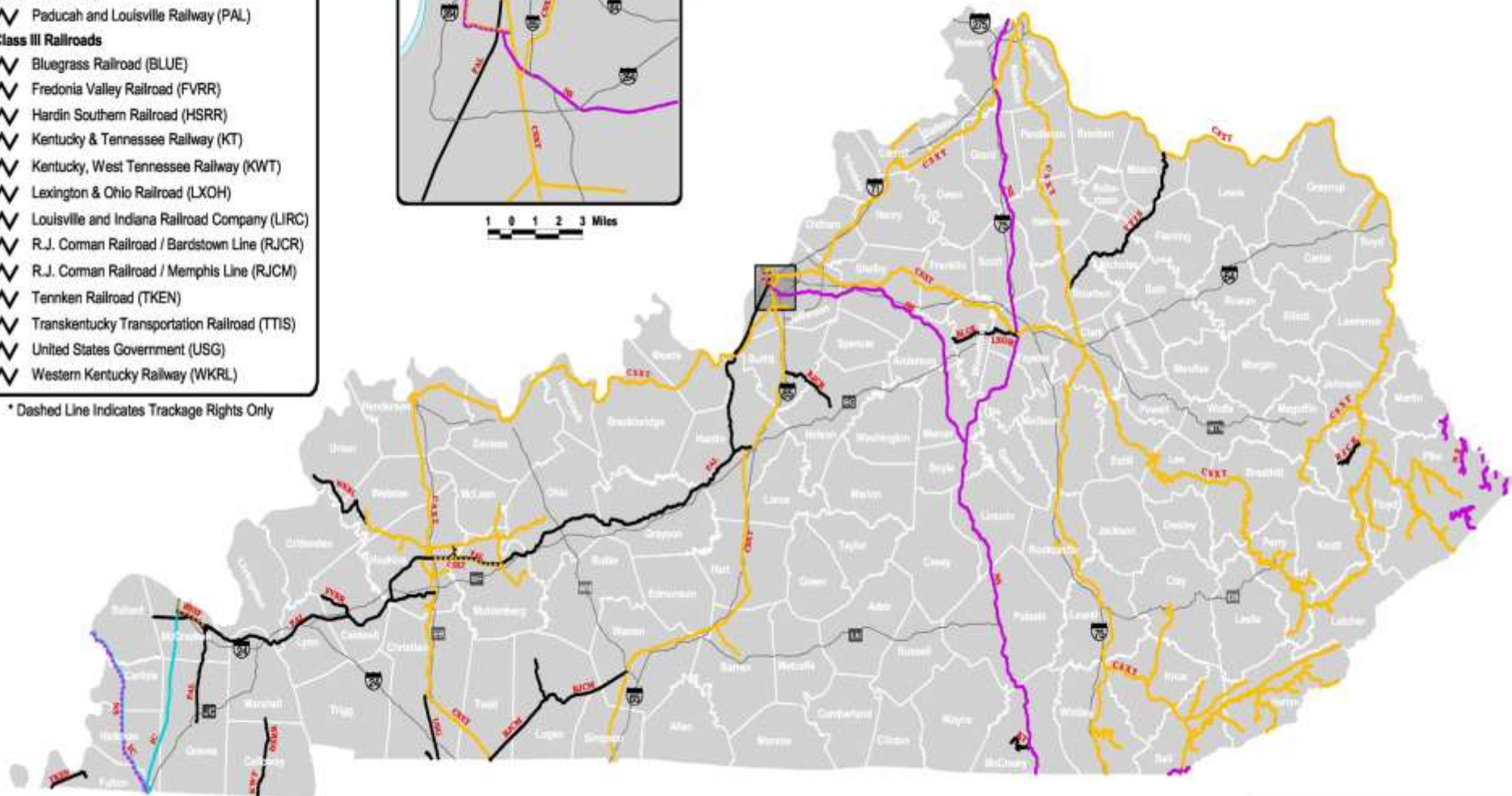


Figure 2-1

2002 Kentucky Railroad System

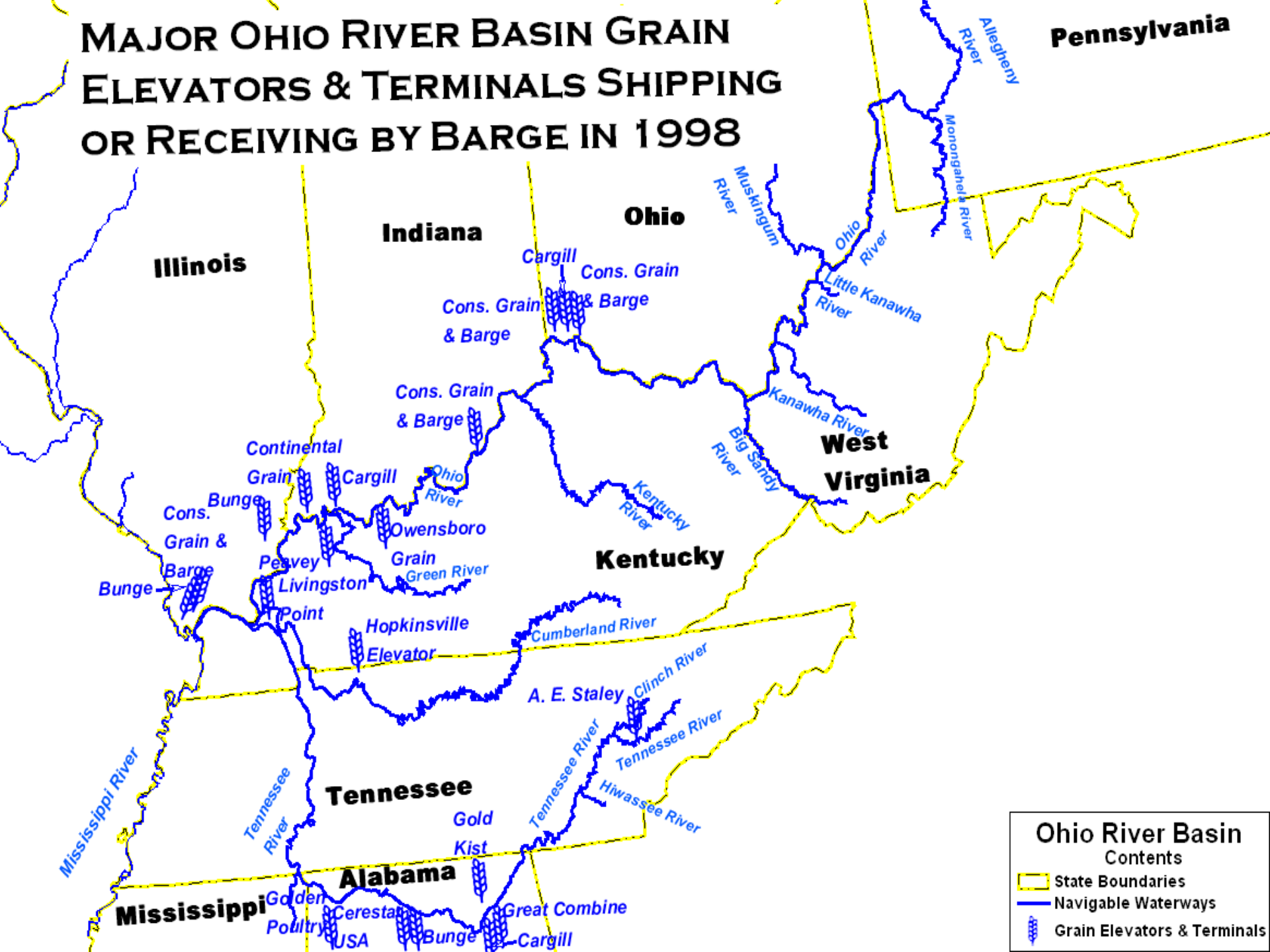
2002 Kentucky Statewide Rail Plan



20 0 20 40 60 Miles

Source: Bureau of Transportation Statistics; 2000 National Transportation Atlas Database; Verified Using The Professional Railroad Atlas of North America, 2nd Edition, Railroad System Maps, and Railroad Internet Resources. Reviewed by Railroad Representative and Other Project Stakeholders.

MAJOR OHIO RIVER BASIN GRAIN ELEVATORS & TERMINALS SHIPPING OR RECEIVING BY BARGE IN 1998















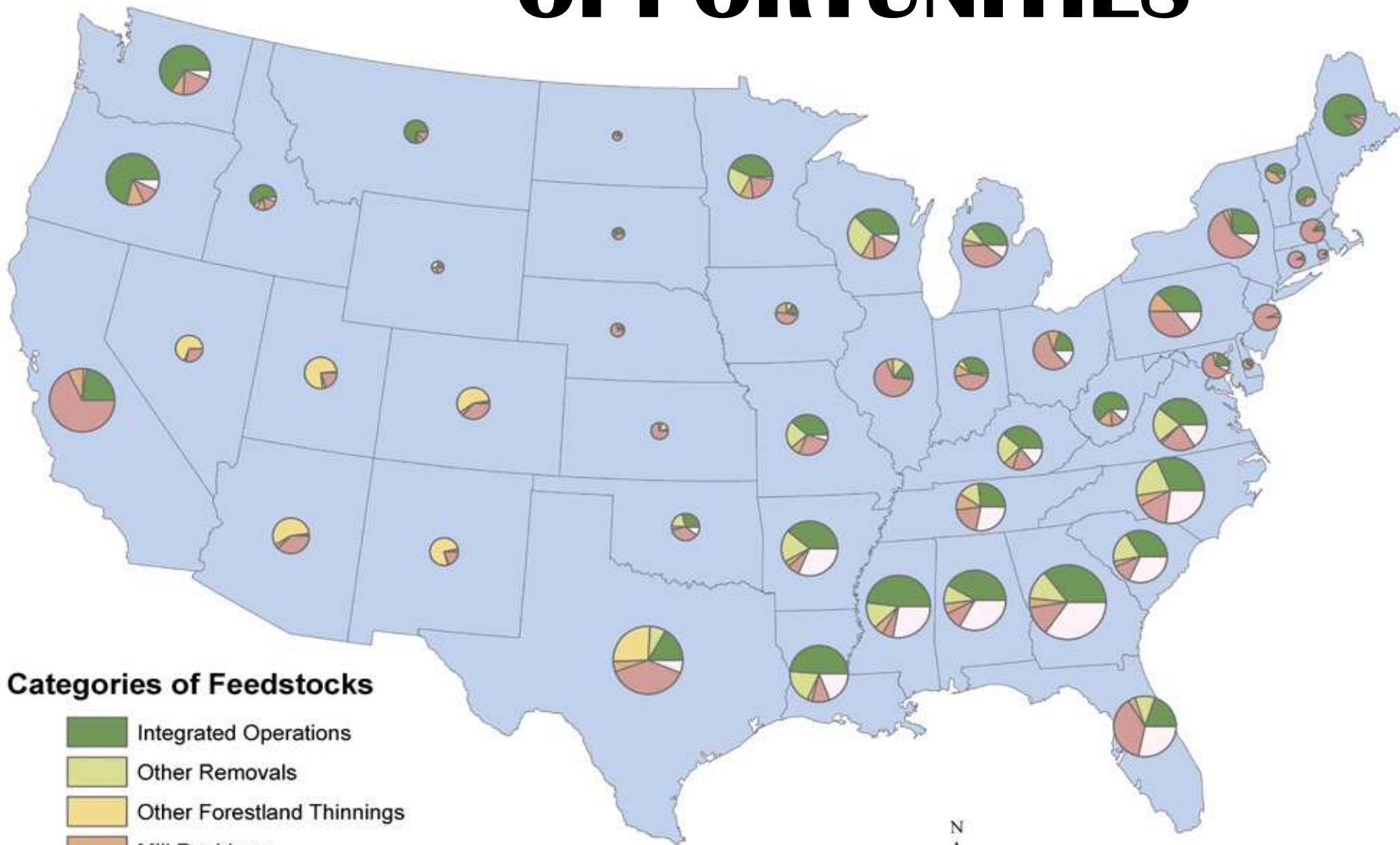


Meets or exceeds

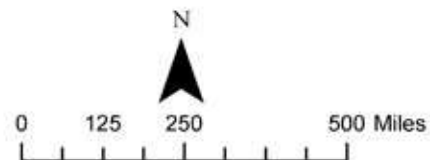
PREMIUM GRADE STANDARDS

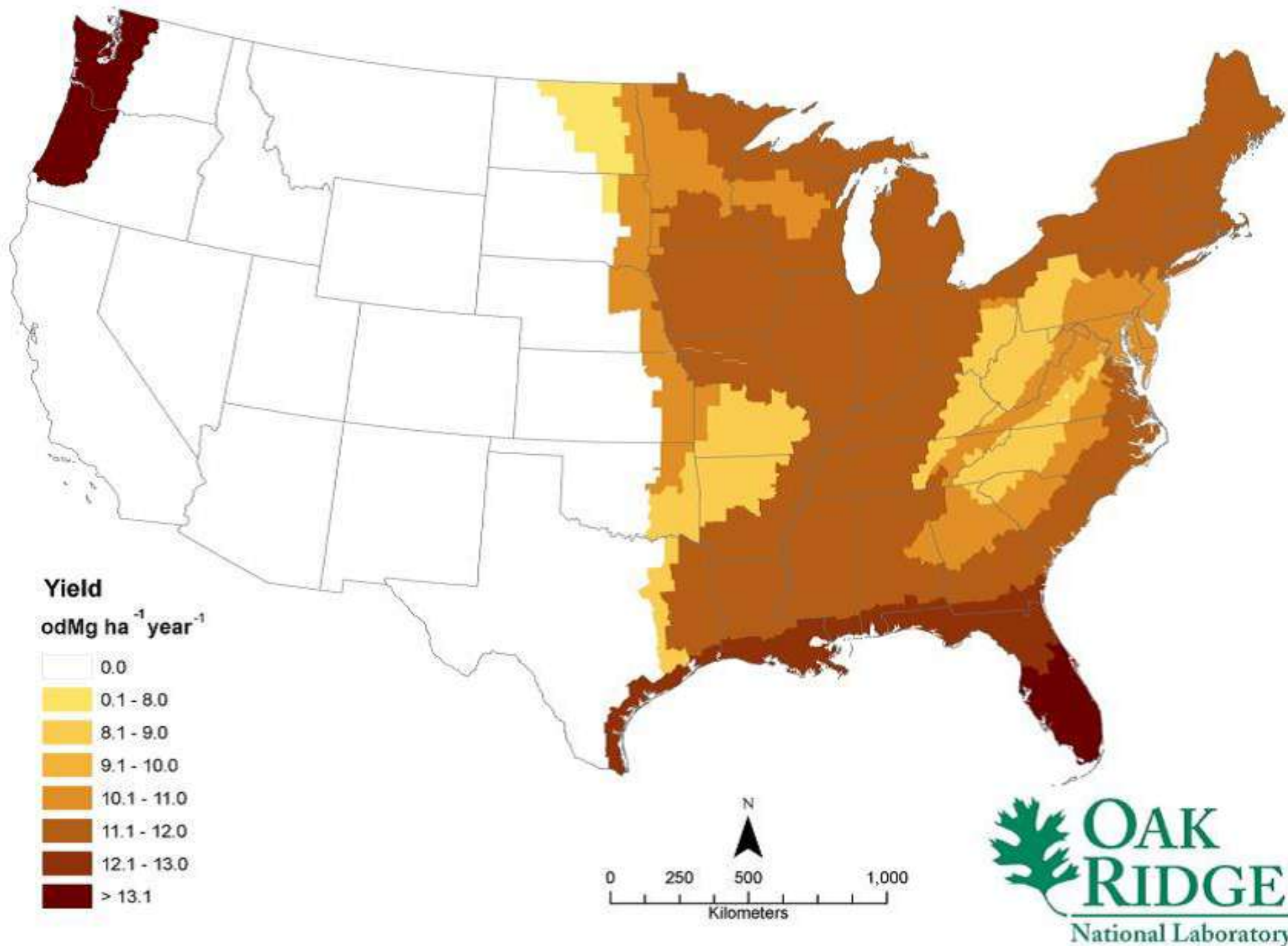
Material	100% Hardwood
Ash	Less than 1%
Fines	Less than 0.5%
Sodium	Less than 300 PPM

OPPORTUNITIES



Categories of Feedstocks





BIOENERGY in Kentucky



Biomass Facilities 2012



- Biodiesel
- Biopower
- Combined Heat & Power
- Ethanol
- Thermal Energy Only
- Wood Pellet

Biopower, biofuel and bioproduct facilities provide **jobs** for Kentucky's communities, particularly in **rural** areas, where **23 percent** of the population lives in poverty and **11 percent** are unemployed.





KINGSFORD

**Kingsford Manufacturing
Company**
Summer Shade, KY





**YOUNG
MANUFACTURING**



Somerset
Hardwood
Flooring



Lyon
County
High



Trigg
County
Hospital



Central Boiler "E-Classic 2400"
wood burning furnace on an
Allen County dairy farm

GROWTH



Poultry farms in KY



EQUINE
INSTRUCTIONAL FACILITY

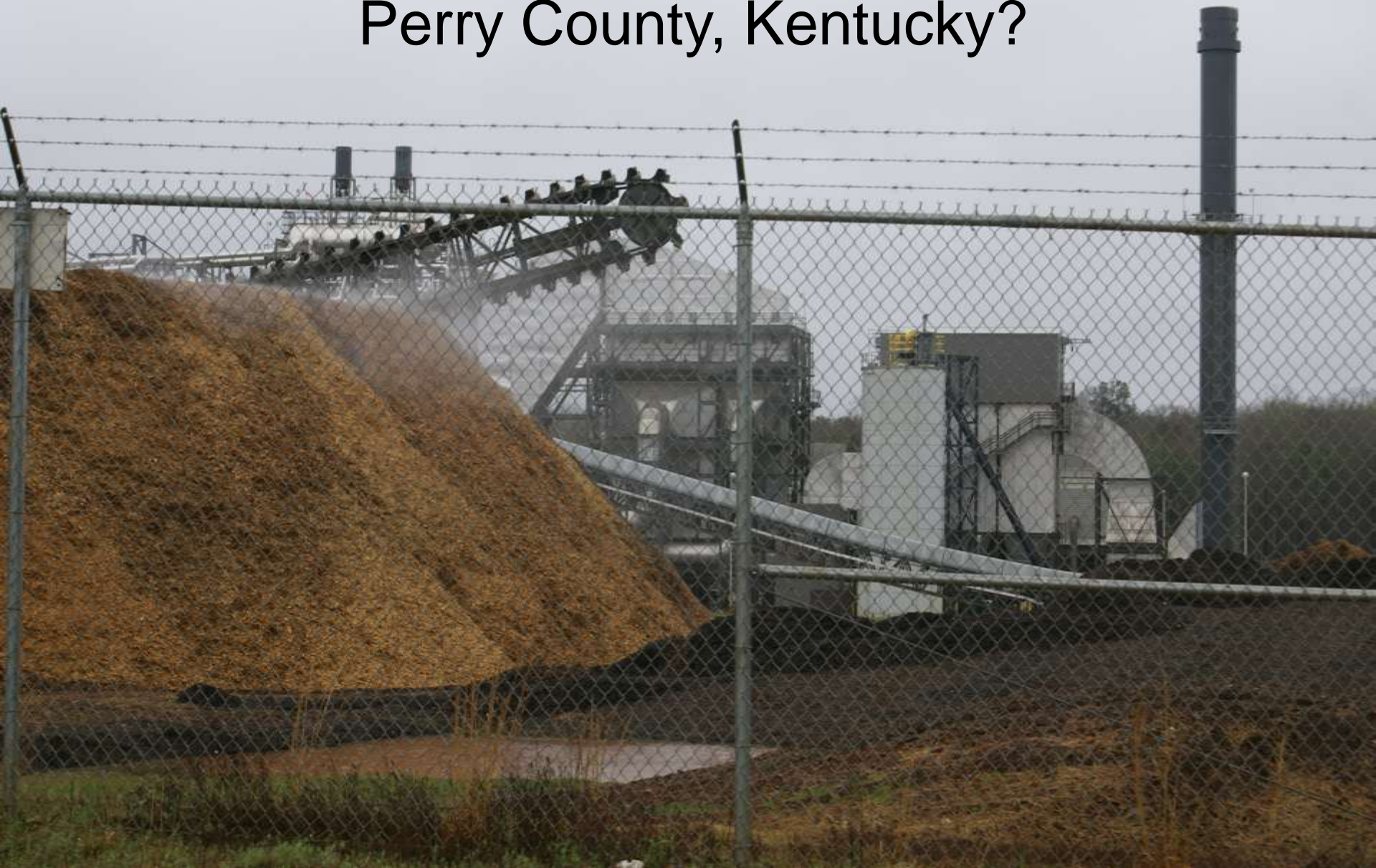


MURRAY STATE UNIVERSITY

Piedmont Green Power Barnesville, Georgia



ecoPower Generation Perry County, Kentucky?





Site Selection; Items of Consideration

Market

- growth potential
- volume mandates
- proximity to feedstock suppliers
- proximity to customers
- status of competitors (best in the world)

Feedstock

- availability
- distance from proposed plant
- delivered price (includes transport costs)
- sustainability (will it be available for the long term)
- competition from other possible uses (fuels, power, other renewable products)

Infrastructure

- road network including trucking costs
- rail network including transport costs
- waterway/seaport proximity including transport costs
- power availability and rates
- process water availability and proximity
- proximity to international air travel
- potential for "clustering" or co-location

Government Programs, Support Mechanisms/Incentives, Mandates

- national
- lander/provincial/state
- local

Local Community Support

- community leaders
- farm groups
- industry associations (local and national)
- forestry sector
- possible industrial partnering opportunities
- municipal politicians
- media
- service clubs
- local environmental groups
- the general public

Economics & Project Finance

- local factors affecting project cost
- materials
- availability of skilled labour
- cost of labour
- unemployment rate
- return on investment
- with government incentives
- without government incentives

Other

- national and international environmental groups support
- proximity to other key stakeholders (media, politicians, public interest groups)

Wood Pellet Plants and European Export

Conceptual Plant to Market Flow Map

Map available: http://www.southernenvironment.org/cases/biomass_energy_in_the_south/maps/

Data Sources: Pellet Industry Releases and Websites; US Census Bureau

Last updated: 7/1/2013 | Map created by Jovian Sackett (jsackett@selcnc.org)





Financial Incentive Opportunities



<http://www.ced.ky.gov>

- New Energy Ventures Fund
- Incentive for Energy Independence Act
- Kentucky Environmental Stewardship Act



<http://agpolicy.ky.gov>

- Loans
- Grants



<http://energy.ky.gov>

- Energy Research Grant



<http://revenue.ky.gov>

- Biodiesel Production or Blending Credit
- Ethanol Producer Credit
- Cellulosic Ethanol Producer Credit



**Safely Providing Steam
While Keeping Our Planet Green**

SUSTAINABILITY





Southern Appalachian Hardwood Forest Reclamation Initiative



- Kentucky Chapter of the American Chestnut Foundation
- Kentucky Division of Mine Reclamation and Enforcement
- Mountain Association for Community Economic Development
- Natural Resources Conservation Service
- Kentucky Department of Fish and Wildlife Resources
- Office of Surface Mining Reclamation and Enforcement
- Kentucky Division of Conservation
- Energy and Environment Cabinet, Department for Natural Resources



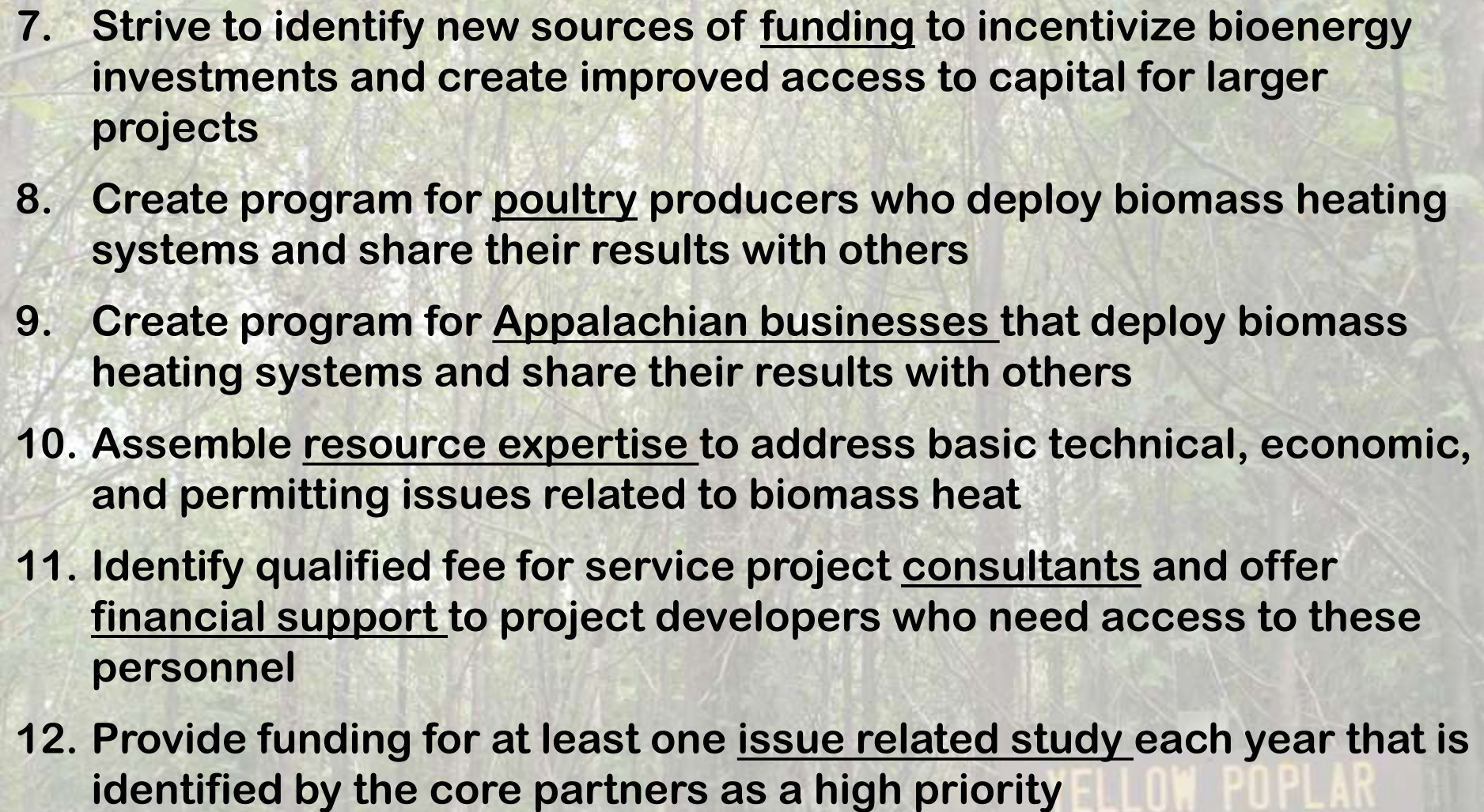


A photograph of a dense forest of yellow poplars. The trees are tall and slender, with green leaves and some brown, dried leaves. A wooden signpost is visible in the lower right corner, with a sign that reads "YELLOW POPLAR". The ground is covered with fallen leaves and some large rocks.

YELLOW POPLAR

Goals and Objectives

- 1. Utilize core team partners to recruit additional supporters and benefactors that can identify and address bioenergy opportunities and deployment challenges throughout the state**
- 2. Empower team leadership to further refine strategies for improvements in forestry Logistics, support current wood to energy Opportunities, promote bioenergy Growth, and enhance economic, energy, and environmental Sustainability**
- 3. Evaluate best opportunities to foster commercial utilization of hazardous fuel resources found at Land Between the Lakes and Daniel Boone National Forests**
- 4. Develop case studies and best practice illustrations that can be shared with interested parties**
- 5. Provide educational programing at various industry conferences related to the **LOGS** themes and tailor messaging for poultry sector and Appalachian region**
- 6. Facilitate tours to farms and businesses that are effectively utilizing bioenergy and build networks of advocates to address critics**

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- The background of the slide is a photograph of a forest. In the lower right corner, a wooden signpost is visible with the words "YELLOW POPLAR" in yellow capital letters. The rest of the image shows dense green foliage and tree trunks.
- 7. Strive to identify new sources of funding to incentivize bioenergy investments and create improved access to capital for larger projects**
 - 8. Create program for poultry producers who deploy biomass heating systems and share their results with others**
 - 9. Create program for Appalachian businesses that deploy biomass heating systems and share their results with others**
 - 10. Assemble resource expertise to address basic technical, economic, and permitting issues related to biomass heat**
 - 11. Identify qualified fee for service project consultants and offer financial support to project developers who need access to these personnel**
 - 12. Provide funding for at least one issue related study each year that is identified by the core partners as a high priority**



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Kentucky Energy & Environment Cabinet

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